

sented in the 4. Figure of the 15. *Scheme*. Or, if you intend to make use of many of these small Beards join'd together, you may have a small long Case of Ivory, whose sides are turn'd of Basket-work, full of holes, which may be screw'd on to the under side of a broad Plate of Ivory, on the other side of which is to be made the divided Ring or Circle, to which divisions the pointing of the Hand or Index, which is moved by the conjoin'd Beard, may shew all the *Minute* variations of the Air.

There may be multitudes of other ways for contriving this small Instrument, so as to produce this effect, which any one may, according to his peculiar use, and the exigency of his present occasion, easily enough contrive and take, on which I shall not therefore insist. The whole manner of making any one of them is thus: Having your Box or frame A A B B, fitly adapted for the free passage of the Air through it, in the midst of the bottom B B B, you must have a very small hole C, into which the lower end of the Beard is to be fix'd, the upper end of which Beard *a b*, is to pass through a small hole of a Plate, or top A A, if you make use onely of a single one, and on the top of it *e*, is to be fix'd a small and very light *Index f g*, made of a very thin sliver of a Reed or Cane; but if you make use of two or more Beards, they must be fix'd and bound together, either with a very fine piece of Silk, or with a very small touch of hard Wax, or Glew, which is better, and the *Index f g*, is to be fix'd on the top of the second, third, or fourth in the same manner as on the single one.

Now, because that in every of these contrivances, the *Index f g*, will with some temperatures of Air, move two, three, or more times round, which without some other contrivance then this, will be difficult to distinguish, therefore I thought of this Expedient: The *Index* or *Hand f g*, being rais'd a pretty way above the surface of the Plate A A, fix in at a little distance from the middle of it a small Pin *h*, so as almost to touch the surface of the Plate A A, and then in any convenient place of the surface of the Plate, fix a small Pin, on which put on a small piece of Paper, or thin Past-board, Vellom, or Parchment, made of a convenient size, and shap'd in the manner of that in the Figure express'd by *i k*, so that having a convenient number of teeth every turn or return of the Pin *h*, may move this small indented Circle, a tooth forward or backwards, by which means the teeth of the Circle, being mark'd, it will be thereby very easie to know certainly, how much variation any change of weather will make upon the small wreath'd body. In the making of this Secondary Circle of Vellom, or the like, great care is to be had, that it be made exceeding light, and to move very easily, for otherwise a small variation will spoil the whole operation. The Box may be made of Brass, Silver, Iron, or any other substance, if care be taken to make it open enough, to let the Air have a sufficiently free access to the Beard. The *Index* also may be various ways contriv'd, so as to shew both the number of the revolutions it makes, and the *Minute* divisions of each revolution.

I have made several trials and Instruments for discovering the driness and moisture of the Air with this little wreath'd body, and find it to vary exceeding sensibly with the least change in the constitution of the Air, as

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to driness and moisture, so that with one breathing upon it, I have made it untwist a whole bout, and the *Index* or *Hand* has shew'd or pointed to various divisions on the upper Face or Ring of the Instrument, according as it was carried neerer and neerer to the fire, or as the heat of the Sun increased upon it.

Other trials I have made with Gut-strings, but find them nothing neer so sensible, though they also may be so contriv'd as to exhibit the changes of the Air, as to driness and moisture, both by their stretching and shrinking in length, and also by their wreathing and unwreathing themselves; but these are nothing neer so exact or so tender, for their varying property will in a little time change very much. But there are several other Vegetable substances that are much more sensible then even this Beard of a wilde *Oat*; such I have found the Beard of the seed of Musk-grass, or *Geranium moschatum*, and those of other kinds of *Cranes-bil* seeds, and the like. But always the smaller the wreathing substance be, the more sensible is it of the mutations of the Air, a conjecture at the reason of which I shall by and by add.

The lower end of this wreath'd Cylinder being stuck upright in a little soft Wax, so that the bended part or *Index* of it lay *horizontal*, I have observ'd it always with moisture to unwreath it self from the East (For instance) by the South to the West, and so by the North to the East again, moving with the Sun (as we commonly say) and with heat and drouth to re-twist, and wreath it self the contrary way, namely, from the East, (for instance) by the North to the West, and so onwards.

The cause of all which *Phænomena*, seems to be the differing texture of the parts of these bodies, each of them (especially the Beard of a wilde *Oat*, and of *Musk-grass* seed) seeming to have two kind of substances, one that is very porous, loose, and spongie, into which the watry steams of the Air may be very easily forced, which will be thereby swell'd and extended in its dimensions, just as we may observe all kind of Vegetable substance upon steeping in water to swell and grow bigger and longer. And a second that is more hard and close, into which the water can very little, or not at all penetrate, this therefore retaining always very neer the same dimensions, and the other stretching and shrinking, according as there is more or less moisture or water in its pores, by reason of the make and shape of the parts, the whole body must necessarily unwreath and wreath it self.

And upon this Principle, it is very easie to make several sorts of contrivances that should thus wreath and unwreath themselves, either by heat and cold, or by driness and moisture, or by any greater or less force, from whatever cause it proceed, whether from gravity or weight, or from wind which is motion of the Air, or from some springing body, or the like.

This, had I time, I should enlarge much more upon; for it seems to me to be the very first footstep of *Sensation*, and Animate motion, the most plain, simple, and obvious contrivance that Nature has made use of to produce a motion, next to that of Rarefaction and Condensation by heat and

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